

Abstract of the Disclosure

A charge forming apparatus for delivering a controlled mixture of fuel-and-air to a combustion engine has a butterfly-type choke valve with throttling capability disposed in an air inlet region of a fuel-and-air mixing passage. Fuel is mixed with air in a downstream primary venturi of the mixing passage. A conventional throttle valve is not disposed downstream of the venturi since the choke valve performs the throttling function. A strong negative pressure produced at the primary venturi, induces fuel flow through a fuel feed passage into the venturi region from a fuel metering chamber of a fuel metering system. The fuel metering chamber is held at near atmospheric pressure when the throttling choke valve is in a closed position for cold-engine starts, or in an open position for running at high engine speeds. When the engine is decelerating and/or when the throttling choke valve is in an idle position, the fuel-and-air mixture ratio becomes leaner by action of a secondary venturi disposed upstream of the primary venturi to prevent engine stalls and to reduce emissions. The vacuum produced by the secondary venturi is substantially weaker than the vacuum produced by the primary venturi. However, the secondary venturi still has a dynamically countering effect to the primary venturi by reducing fuel flow through the fuel feed passage when the throttling choke valve is in the idle position. The secondary venturi is defined between an interior wall which defines the air inlet region and a plate of the throttling choke valve when in the idle position. The small clearance created between the plate and the interior wall produces the high air flow velocity which induces the vacuum exposed to a reference nozzle of a reference passage. The vacuum is transmitted via the reference passage to a reference chamber of the fuel metering system which is separated from the fuel metering chamber by a flexible diaphragm. When the throttling choke valve is not in the idle

position, the plate pivots out of the position necessary to create the secondary venturi and the reference chamber is exposed to near atmospheric pressure.